



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,852	10/30/2003	Nedim Erkocevic	N.ERKOCEVIC 8	8088
47396	7590	09/27/2005	EXAMINER	
HITT GAINES, PC AGERE SYSTEMS INC. PO BOX 832570 RICHARDSON, TX 75083			AL NAZER, LEITH A	
			ART UNIT	PAPER NUMBER
			2821	

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,852

Applicant(s)

ERKOCEVIC, NEDIM

Examiner

Leith A. Al-Nazer

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 37 is/are allowed.
- 6) ☒ Claim(s) 1-36 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 and 22 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 12, and 25 recite a monopole antenna printed circuit supported by the substrate, having a single ground path including a portion of the inverted F antenna printed circuit. This recitation is vague and unclear, and as a result, Examiner is unsure of what structure Applicant is attempting to claim. Specifically, the phrase "...having a single ground path including a portion of the inverted F antenna printed circuit..." is vague and indefinite. It is unclear, even after referring to the figures, how the single ground path "includes" a portion of the inverted F antenna printed circuit.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Art Unit: 2821

4. Claims 1, 2, 4, 5, 10, 11, 25, 26, 28, 29, and 34-36 are rejected under 35 U.S.C. 102(a) as being unpatentable by U.S. Patent No. 6,515,629 to Kuo et al.

With respect to claim 1, Kuo teaches a dual-band antenna comprising a substrate (10); an inverted F antenna printed circuit (42) supported by the substrate and tuned to resonate in a first frequency band; and a monopole antenna printed circuit (40) supported by the substrate, having a single ground path including a portion of the inverted F antenna printed circuit and tuned to resonate in a second frequency band (column 4, lines 17-39).

With respect to claims 2 and 26, Kuo teaches the feed line (60) being located on a different plane of the substrate from a radiator of the inverted F antenna printed circuit and the monopole antenna printed circuit being coupled to the feed line (figure 1).

With respect to claims 4 and 28, Kuo teaches a ground plane (20) of the inverted F antenna printed circuit being coupled to and spaced apart from both a radiator of the inverted F antenna printed circuit and the monopole antenna printed circuit (figure 2).

With respect to claims 5 and 29, Kuo teaches a ground plane of the inverted F antenna printed circuit being located on a different plane from the monopole antenna printed circuit (figure 2).

With respect to claims 10 and 34, Kuo teaches the first frequency band being lower than the second frequency band (column 4, lines 17-39).

With respect to claims 11 and 35, Kuo teaches the first frequency band being between about 2.4 GHz and about 2.5 GHz and the second frequency band being between about 5.2 GHz and about 5.8 GHz (column 4, lines 17-39).

Art Unit: 2821

With respect to claim 25, Kuo teaches a method of manufacturing a dual-band antenna, comprising forming an inverted F antenna (42) printed circuit on a substrate, the inverted F antenna printed circuit tuned to resonate in a first frequency band; and forming a monopole antenna (40) printed circuit on the substrate having a single ground path including a portion of the inverted F antenna printed circuit and tuned to resonate in a second frequency band (column 4, lines 17-39).

With respect to claim 36, Kuo teaches a dual-band antenna, comprising: a substrate (10); an inverted F antenna printed circuit (42) supported by the substrate and tuned to resonate in a first frequency band; a feed line (60) located on a different plane of the substrate from a radiator of the inverted F antenna printed circuit (figure 1); and a monopole antenna printed circuit (40), coupled to the inverted F antenna printed circuit and the feed line, the monopole antenna printed circuit, coupled to the inverted F antenna printed circuit and the feed line, the monopole antenna printed circuit supported by the substrate and tuned to resonate in a second frequency band (column 4, lines 17-39).

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2821

6. Claim 38 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,611,235 to Barna et al.

With respect to claim 38, Barna teaches a dual-band antenna, comprising: a substrate; an inverted F antenna printed circuit (b31) supported by the substrate and tuned to resonate in a first frequency band; and a monopole antenna printed circuit (b11 and b21) supported by the substrate, connected to the inverted F antenna printed circuit and tuned to resonate in a second frequency band, the monopole antenna printed circuit including a first trace (b11) directly coupled to a second trace (b21) and each trace tuned to differing resonance in the second frequency band.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 6-8, 30-32, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,515,629 to Kuo et al. in view of U.S. Patent No. 6,100,848 to Hayes.

Claims 6-8 and 30-32 require that the monopole antenna printed circuit comprise first and second traces tuned to differing resonance in the frequency band. Such a configuration is well known in the art, as is evidenced by Hayes (18 and 36 in figure 5). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize a monopole antenna with first and second traces in the system of Kuo. The motivation for doing so would have been to provide means for tuning to a plurality of frequencies.

With respect to claim 38, Kuo teaches a dual-band antenna, comprising: a substrate (10); an inverted F antenna printed circuit (42) supported by the substrate and tuned to resonate in a first frequency band; and a monopole antenna printed circuit (40) supported by the substrate, connected to the inverted F antenna printed circuit and tuned to resonate in a second frequency band (column 4, lines 17-39). Claim 38 requires that the monopole antenna printed circuit include a first trace directly coupled to a second trace and each trace tuned to differing resonance in the second frequency band. Such a configuration is well known in the art, as is evidenced by Hayes (18 and 36 in figure 5). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize a monopole antenna with first and second traces in the system of Kuo. The motivation for doing so would have been to provide means for tuning to a plurality of frequencies.

10. Claims 9 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,515,629 to Kuo et al. in view of U.S. Patent No. 6,567,048 to McKinzie, III et al. or U.S. Patent Application Publication No. 2002/0004125 to Ostrovsky.

Claims 9 and 33 require the substrate be composed of a higher loss material and have a plurality of lower loss regions located proximate a radiator of the inverted F antenna printed circuit and the monopole antenna printed circuit. It is well known in the art that, in order to radiate efficiently, antennas must be formed in low loss materials rather than high loss materials, as is suggested by McKinzie (column 2, lines 23-33) and Ostrovsky (paragraphs 0002-0013). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to include a plurality of lower loss regions located proximate a radiator of the inverted F antenna printed circuit and the monopole antenna printed circuit. The motivation for doing so would have been to provide a material in which the radiating element could operate efficiently.

11. Claims 12, 13, 15, 16, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,515,629 to Kuo et al. in view of U.S. Patent Application Publication No. 2003/0001787 to Clifton or U.S. Patent Application No. 2003/0207668 to McFarland et al.

With respect to claim 12, Kuo teaches a dual-band antenna including a substrate (10), an inverted F antenna printed circuit (42) supported by the substrate and tuned to

Art Unit: 2821

resonate in a first frequency band, and a monopole antenna printed circuit (40) supported by the substrate, having a single ground path including a portion of the inverted F antenna printed circuit and tuned to resonate in a second frequency band. Claim 12 requires wireless networking circuitry and a dual band transceiver coupled to the wireless networking circuitry. Such a configuration is well known in the art, as is evidenced by Clifton (paragraphs 0008-0013) and McFarland (figure 4). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to provide the antenna system of Kuo with the wireless network circuitry and dual-band transceiver of Clifton or McFarland. The motivation for doing so would have been to provide circuitry and an overall system capable of utilizing the dual-band feature of the antenna taught by Kuo.

With respect to claim 13, Kuo teaches the feed line (60) being located on a different plane of the substrate from a radiator (42) of the inverted F antenna printed circuit and the monopole antenna printed circuit (40) being coupled (62) to the feed line (figure 1).

With respect to claim 15, Kuo teaches a ground plane (20) of the inverted F antenna printed circuit being coupled to and spaced apart from both a radiator of the inverted F antenna printed circuit and the monopole antenna printed circuit (figure 2).

With respect to claim 16, Kuo teaches a ground plane of the inverted F antenna printed circuit being located on a different plane from the monopole antenna printed circuit (figure 2).

Art Unit: 2821

With respect to claim 21, Kuo teaches the first frequency band being lower than the second frequency band (column 4, lines 17-39).

With respect to claim 22, Kuo teaches the first frequency band being between about 2.4 GHz and about 2.5 GHz and the second frequency band being between about 5.2 GHz and about 5.8 GHz (column 4, lines 17-39).

Claims 23 and 24 require a second dual-band antenna be coupled to the dual-band transceiver. At the time of the invention, it would have been obvious to one having ordinary skill in the art to take the systems Kuo, Clifton, and McFarland, and add a second dual-band antenna. The motivation for doing so would have been to provide more operating frequencies.

12. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,515,629 to Kuo et al. in view of U.S. Patent Application Publication No. 2003/0001787 to Clifton or U.S. Patent Application No. 2003/0207668 to McFarland et al. as applied to claims 12-16 and 21-24 above, and further in view of U.S. Patent No. 6,100,848 to Hayes.

Claims 17-19 require that the monopole antenna printed circuit comprise first and second traces tuned to differing resonance in the frequency band. Such a configuration is well known in the art, as is evidenced by Hayes (18 and 36 in figure 5). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize a monopole antenna with first and second traces in the system of Kuo. The

Art Unit: 2821

motivation for doing so would have been to provide means for tuning to a plurality of frequencies.

13. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,515,629 to Kuo et al. in view of U.S. Patent Application Publication No. 2003/0001787 to Clifton or U.S. Patent Application No. 2003/0207668 to McFarland et al. as applied to claims 12-16 and 21-24 above, and further in view of U.S. Patent No. 6,567,048 to McKinzie, III et al. or U.S. Patent Application Publication No. 2002/0004125 to Ostrovsky.

Claim 20 requires the substrate be composed of a higher loss material and have a plurality of lower loss regions located proximate a radiator of the inverted F antenna printed circuit and the monopole antenna printed circuit. It is well known in the art that, in order to radiate efficiently, antennas must be formed in low loss materials rather than high loss materials, as is suggested by McKinzie (column 2, lines 23-33) and Ostrovsky (paragraphs 0002-0013). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to include a plurality of lower loss regions located proximate a radiator of the inverted F antenna printed circuit and the monopole antenna printed circuit. The motivation for doing so would have been to provide a material in which the radiating element could operate efficiently.

Allowable Subject Matter

14. Claim 37 is allowed.

15. Claims 3, 14, and 27 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest one or more of the limitations found in claims 3, 14, 27, and 37. With respect to claims 3, 14, 27, and 37, the prior art of record fails to teach or suggest the combination of an inverted F antenna printed circuit; a monopole antenna printed circuit; a feed line located on one surface of the substrate; and a conductive interconnection coupling the feed line to a radiator of the inverted F antenna printed circuit located on an opposing surface of the substrate.

Response to Arguments

17. Applicant's arguments, see pages 11, 12, 14, and 15 of the amendment, filed 22 August 2005, with respect to claims 3, 14, and 27 have been fully considered and are persuasive. The rejection of claims 3, 14, and 27 under 35 USC 102 and 35 USC 103, respectively, has been withdrawn.

18. Applicant's arguments filed 22 August 2005 have been fully considered but they are not persuasive.

Applicant has amended independent claims 1, 12, and 25 to include a monopole antenna printed circuit supported by the substrate, having a single ground path including a portion of the inverted F antenna printed circuit. However, as outlined above in the rejection under 35 USC 112, Examiner is unsure what structure this added recitation is attempting to claim.

With respect to independent claims 1, 12, and 25, Applicant argues that Kuo teaches discloses the metal lines 40 and 42 of the dual band inverted F antenna have multiple paths to ground. Examiner disagrees. It is clear from figures 1 and 2 that in at least one of the embodiments, Kuo teaches a single ground path (22 in figures 1 and 2).

With respect to independent claim 36, Applicant argues that Kuo does not teach a dual-band antenna having a feed line located on a different plane of a substrate from a radiator of an inverted F antenna printed circuit. Examiner disagrees. Applicant does not specify any plane orientations, such as horizontal or vertical planes. As a result, Kuo does, in fact, teach a dual-band antenna having a feed line located on a different plane of a substrate from a radiator of the inverted F antenna printed circuit because, referring to figure 1, Kuo teaches the feed line being located in a different vertical plane (for example, planes perpendicular to the plane of the page) than the plane or planes of the inverted F antenna printed circuit.

With respect to claim 38, Applicant argues that the first and second traces of the monopole antenna of Hayes are not directly coupled. Examiner disagrees. Figure 5 clearly shows the first and second traces (18 and 36) being directly coupled through grounding structure 34 (figure 5). Examiner has further rejected claim 38 under 35 USC

Art Unit: 2821

102(e) in view of U.S. Patent No. 6,611,235 to Barna et al. Barna teaches first and second traces of a monopole antenna being directly coupled (figure 20).

Citation of Pertinent References

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patent documents further show the state of the art with respect to dual-band antenna structures:

- a. U.S. Patent No. 6,408,190 to Ying
- b. U.S. Patent No. 6,529,168 to Mikkola et al.
- c. U.S. Patent No. 6,535,170 to Sawamura et al.
- d. U.S. Patent No. 6,734,825 to Guo et al.
- e. U.S. Patent No. 6,795,028 to Stutzman et al.
- f. U.S. Patent No. 6,922,172 to Oshiyama et al.
- g. U.S. Patent No. 2002/0019247 to Egorov
- h. U.S. Patent No. 2002/0186169 to Iwai et al.
- i. European Patent Document No. EP 0 986 130 A2 to Huber et al.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2821

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication Information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leith A. Al-Nazer whose telephone number is 571-272-1938. The examiner can normally be reached on Monday-Friday, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2821

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LA


WILSON LEE
PRIMARY EXAMINER